C11

wherein said oxidizing the semiconductor film is performed in a temperature of 500 to 650°C.

C12

86. (Amended) A method of manufacturing a semiconductor device having a plurality of thin film transistors, comprising the steps of:

forming a semiconductor film comprising silicon over an alkali-free glass substrate;

crystallizing said semiconductor film;

forming an insulating film adjacent to said crystallized semiconductor film; and

forming gate electrodes adjacent to said insulating film,

wherein said method further comprises a step of oxidizing the crystallized semiconductor film to be active layers of said thin film transistors in a pressurized atmosphere of a pressure of 1 to 15 atms, and

wherein said oxidizing the semiconductor film is performed in a temperature lower than a strain point of said glass substrate.

REMARKS

The Office Action of **June 4, 2001**, has been received and its contents carefully noted. Applicant respectfully submits that this response is timely filed. Claims 1-105 were pending in the present application prior to the aforementioned amendment. Due to the above actions, claims 1, 9, 17, 25, 33, 41, 49, 56, 63, 70, 78 have been amended to clearly recite subject matter to which Applicant is entitled. Applicant submits that no issue of new matter is raised by this Amendment. Accordingly, claims 1-105 are still pending in the present application and, for the reasons set forth below, are believed to be in condition for allowance.

The Office Action rejects claims 1-12, 14-16, 49-58, 60-62, 70-81, 83-85 and 94 under 35 U.S.C. 102(b) as clearly anticipated by ***Ipri*** (U.S. Patent No. 4,597,160), claims 17-24, 63-69, 86-93 and 95 under 35 U.S.C. 103(a) as unpatentable over ***Ipri '160*** in view of ***Troxell et al.*** (U.S. Patent No. 4,851,363), claims 13, 59, 82, 98, 102 and 104 under 35 U.S.C. 103(a) as unpatentable over ***Ipri '160*** in view of pp. 216-217 of ***Wolf et al.***, claims 99, 103, and 105 under 35 U.S.C. 103(a) as unpatentable over ***Ipri '160*** in view of ***Troxell et al. '363*** and pp. 216-217 of ***Wolf et al.***, claims 25-36, 38-40 and 96 under 35 U.S.C. 103(a) as unpatentable over ***Ipri '160*** in view of pp. 171-175 of ***Wolf et al.***,. claims 41-48 and 97 under 35 U.S.C. 103(a) as unpatentable over ***Ipri '160*** in view of ***Troxell et al. '363*** and pp. 171-175 of ***Wolf et al.***, claims 37 and 100 under 35 U.S.C. 103(a) as unpatentable over ***Ipri '160*** in view of pp. 171-175 of ***Wolf et al.*** and pp. 216-217 of ***Wolf et al.***, and claim 101 under 35 U.S.C. 103(a) as unpatentable over ***Ipri '160*** in view of ***Troxell et al. '363*** and pp. 216-217 of ***Wolf et al.*** and pp. 171-175 of ***Wolf et al.*** By the above Amendment, claims 1, 9, 17, 25, 33, 41, 49, 56, 63, 70, 78 have been amended to more clearly recite subject matter which is patentably distinct over the prior art of record at least for the reasons set forth hereinbelow.

The claimed invention is directed generally to a method of manufacturing a display device having a plurality of thin film transistors comprising the steps of forming a semiconductor film over a glass substrate and oxidizing the semiconductor film to be active layers of the thin film transistors in a pressurized atmosphere at a temperature lower than a strain point of the glass substrate. It should be noted that the claimed invention provides a step of oxidizing the semiconductor layer under the pressurized atmosphere to lower the temperature below the strain point of the glass substrate.

As the Examiner well knows, "a claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a

single prior art reference." *Verdegaal Bros. v. Union Oil Co. Of California*, 814 F.2d 628, 631, 2 USPQ2d 1051 (Fed. Cir. 1987). "The identical invention must be shown in as complete detail as is contained in the...claims." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913 (Fed. Cir. 1989).

Moreover, in formulating a rejection under 35 USC §103, a four-level factual inquiry must be conducted. First, determining the scope and content of the prior art. Secondly, ascertaining the differences between the claimed invention and the prior art. Thirdly, resolving the level of ordinary skill in the pertinent art. And last, an evaluation of objective evidence of non-obviousness. *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966). In essence, to establish a *prima facie* case of obviousness, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 180 USPQ 580 (CCPA 1974).

Applicant respectfully contends that the claims as presently set forth recite subject matter which is clearly patentably distinct over the prior art of record. More particularly, Applicant respectfully contends that the ***Ipri '160*** patent fails to expressly teach or inherently describe each and every limitation necessary to anticipate the claimed invention under §102. In addition, the ***Ipri '160*** patent, either alone or in combination with the ***Troxell et al. '363*** patent and pp. 216-217 and 171-175 of the ***Wolf et al. et al.*** publications, fails to expressly teach or inherently suggest all of the limitations presently set forth in the claimed invention necessary to support a *prima facie* case of obviousness under §103. Nor is there any motivation in the prior art of record to modify the ***Ipri '160*** patent to thereby accomplish what is set forth in the claimed invention.

The Office Action finds that the ***Ipri '160*** patent sets forth subject matter which either anticipates, or renders obvious, the claimed features of the present invention. However, it is respectfully contended that the ***Ipri '160*** patent fails to expressly teach or inherently suggest a method of manufacturing a display device having a plurality of thin

inherently suggest a method of manufacturing a display device having a plurality of thin film transistors comprising the steps oxidizing a semiconductor film in a pressurized atmosphere, as currently set forth in the claimed invention.

In addition, although the oxidation of silicon under a pressurized atmosphere itself is known, as described in Katz et al. and Ligenza in the Office Action, the claimed invention is patentable over the prior art of record at least since the step of oxidizing a semiconductor layer in a pressurized atmosphere has not been applied to a thin film device, especially a thin film device over a glass substrate, as presently recited in the claimed invention.

Regarding the rejection of claims 1-105 under double patenting, Applicant would like for these rejections to be held in abeyance until a allowability has been indicated by the Examiner.

Accordingly, Applicant respectfully contends that the claimed invention is directed to subject matter which is patentably distinct over the prior art and also submit that the pending claims are in proper condition for allowance. If the Examiner believes further discussions with Applicants' representative would be beneficial in this case, he is invited to contact the undersigned.

Respectfully submitted,

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Marked-up Version of Amended Claims

1. (Amended) A method of manufacturing a semiconductor device having a plurality of thin film transistors, comprising the steps of:

forming a semiconductor film comprising silicon over a glass substrate;

crystallizing said semiconductor film; and

oxidizing the crystallized semiconductor film to be active layers of said thin film transistors [at a pressure higher than 1 atm] in a pressurized atmosphere [in] at a temperature lower than a strain point of said glass substrate.

9. (Amended) A method of manufacturing a semiconductor device having a plurality of thin film transistors, comprising the steps of:

forming a semiconductor film comprising silicon on an insulating surface;

crystallizing said semiconductor film; and

oxidizing the crystallized semiconductor film to be active layers of said thin film transistors [at a pressure higher than 1 atm] in a pressurized atomsphere [in] at a temperature of 500 to 650°C.

17. (Amended) A method of manufacturing a semiconductor device having a plurality of thin film transistors, comprising the steps of:

forming a semiconductor film comprising silicon over an alkali-free glass substrate;

crystallizing said semiconductor film; and

oxidizing the crystallized semiconductor film to be active layers of said thin film transistors [at a pressure higher than 1 atm] in a pressurized atmosphere [in] at a temperature lower than a strain point of said glass substrate.

25. (Amended) A method of manufacturing a semiconductor device having a plurality of thin film transistors, comprising the steps of:

forming a semiconductor film comprising silicon over a glass substrate;

crystallizing said semiconductor film;

forming an insulating film adjacent to said crystallized semiconductor film by plasma CVD; and

forming gate electrodes adjacent to said insulating film,

wherein said method further comprises a step of oxidizing the crystallized semiconductor film to be active layers of said thin film transistors [at a pressure higher than 1 atm] in a pressurized atmosphere [in] at a temperature lower than a strain point of said glass substrate.

33. (Amended) A method of manufacturing a semiconductor device having a plurality of thin film transistors, comprising the steps of:

forming a semiconductor film comprising silicon on an insulating surface;

crystallizing said semiconductor film;

forming an insulating film adjacent to said crystallized semiconductor film by plasma CVD; and

forming gate electrodes adjacent to said insulating film,

wherein said method further comprises a step of oxidizing the crystallized semiconductor film to be active layers of said thin film transistors [at a pressure higher than 1 atm] in a pressurized atomsphere [in] at a temperature of 500 to 650°C.

41. (Amended) A method of manufacturing a semiconductor device having a plurality of thin film transistors, comprising the steps of:

forming a semiconductor film comprising silicon over an alkali-free glass substrate;

crystallizing said semiconductor film;

forming an insulating film adjacent to said crystallized semiconductor film by plasma CVD; and

forming gate electrodes adjacent to said insulating film,

wherein said method further comprises a step of oxidizing the crystallized semiconductor film to be active layers of said thin film transistors [at a pressure higher than 1 atm] in a pressurized atmosphere [in] at a temperature lower than a strain point of said glass substrate.

49. (Amended) A method of manufacturing a semiconductor device having a plurality of thin film transistors, comprising the steps of:

forming a semiconductor film comprising silicon over a glass substrate;

crystallizing said semiconductor film; and

oxidizing the crystallized semiconductor film to be active layers of said thin film transistors in a pressurized atmosphere [at] of a pressure of 1 to 15 atms,

wherein said oxidizing the semiconductor film is performed in a temperature lower than a strain point of said glass substrate.

56. (Amended) A method of manufacturing a semiconductor device having a plurality of thin film transistors, comprising the steps of:

forming a semiconductor film comprising silicon on an insulating surface;

crystallizing said semiconductor film; and

oxidizing the crystallized semiconductor film to be active layers of said thin film

transistors in a pressurized atmosphere [at] of a pressure of 1 to 15 atms,

wherein said oxidizing the semiconductor film is performed in a temperature of 500 to 650°C.

63. (Amended) A method of manufacturing a semiconductor device having a plurality of thin film transistors, comprising the steps of:

forming a semiconductor film comprising silicon over an alkali-free glass substrate;

crystallizing said semiconductor film; and

oxidizing the crystallized semiconductor film to be active layers of said thin film transistors in pressurized atmosphere [at] of a pressure of 1 to 15 atms, for elactrically isolating said plurality of thin film transistors from one another,

wherein said oxidizing the semiconductor film is performed in a temperature lower than a strain point of said glass substrate.

70. (Amended) A method of manufacturing a semiconductor device having a plurality of thin film transistors, comprising the steps of:

forming a semiconductor film comprising silicon over a glass substrate;

crystallizing said semiconductor film;

forming an insulating film adjacent to said crystallized semiconductor film; and

forming gate electrodes adjacent to said insulating film,

wherein said method further comprises a step of oxidizing the crystallized semiconductor film to be active layers of said thin film transistors in a pressurized atmosphere [at] of a pressure of 1 to 15 atms, and

wherein said oxidizing the semiconductor film is performed in a temperature

lower than a strain point of said glass substrate.

78. (Amended) A method of manufacturing a semiconductor device having a plurality of thin film transistors, comprising the steps of:

forming a semiconductor film comprising silicon on an insulating surface;

crystallizing said semiconductor film;

forming an insulating film adjacent to said crystallized semiconductor film; and

forming gate electrodes adjacent to said insulating film,

wherein said method further comprises a step of oxidizing the crystallized semiconductor film to be active layers of said thin film transistors in a pressurized atmosphere [at] of at a pressure of 1 to 15 atms, and

wherein said oxidizing the semiconductor film is performed in a temperature of 500 to 650°C.

86. (Amended) A method of manufacturing a semiconductor device having a plurality of thin film transistors, comprising the steps of:

forming a semiconductor film comprising silicon over an alkali-free glass substrate;

crystallizing said semiconductor film;

forming an insulating film adjacent to said crystallized semiconductor film; and

forming gate electrodes adjacent to said insulating film,

wherein said method further comprises a step of oxidizing the crystallized semiconductor film to be active layers of said thin film transistors in a pressurized atmosphere [at] of a pressure of 1 to 15 atms, and

wherein said oxidizing the semiconductor film is performed in a temperature

lower than a strain point of said glass substrate.